on the same defined pattern of antenna beams and starting a fixed "AFC interval" after the multi-beam acquisition sequence. Optionally, apparatus **20** may be controlled by memory **34** and processor **32** to communicate the multi-beam pattern if it is not known by the AP and UD a priori. In addition, apparatus **20** may be controlled by memory **34** and processor **32** to repeat the multi-beam acquisition sequence and possibly the multi-beam AFC sequence to allow AGC adjustment.

[0065] FIG. **10** illustrates an example of a flow diagram of a method, according to an embodiment. In this embodiment, the method may be performed by the AP described above. The method may include, at **900**, transmitting, by the AP, a multi-beam acquisition sequence comprising a short acquisition burst repeated on a defined pattern of antenna beams. At **905**, the method may include starting a fixed AFC interval after the multi-beam acquisition sequence, and, at **910**, transmitting a multi-beam AFC sequence comprising a short AFC burst repeated on said defined pattern of antenna beams.

[0066] In some embodiment, the method may optionally include, at **915**, communicating the multi-beam pattern when it is not known by the AP and UD a priori. At **920**, the method may include repeating the multi-beam acquisition sequence to allow AGC adjustment and/or repeating the multi-beam AFC sequence to allow AFC adjustment.

[0067] FIG. **11** illustrates an example of a flow diagram of a method, according to another embodiment. In this embodiment, the method may be performed by the UD described above. The method may include, at **930**, setting, by the UD, AGC in its receiver to maximum gain (or alternatively the UD could set the AGC to some large gain not necessarily the maximum). At **935**, the method may include detecting at least one acquisition burst in a multi-beam acquisition sequence, and, at **940**, detecting at least one corresponding AFC burst in a multi-beam AFC sequence one AFC interval later. The method may further include, at **945**, calculating a frequency offset based on the detected at least one acquisition burst and the detected at least one corresponding AFC burst. In an embodiment, the method may include, at **950**, receiving a communication of a multi-beam pattern if it is not known at the user device a priori. At **955**, the method may further include reducing the AGC setting to determine whether a beam with a stronger signal is detected. In another embodiment, the UD may further communicate the best beam (i.e., the one whose acquisition and/or AFC pilot transmission received with the highest gain) to the AP.

[0068] In some embodiments, the functionality of any of the methods described herein, such as those of FIGS. **11** and **12**, may be implemented by software and/or computer program code stored in memory or other computer readable or tangible media, and executed by a processor. In other embodiments, the functionality may be performed by hardware, for example through the use of an application specific integrated circuit (ASIC), a programmable gate array (PGA), a field programmable gate array (FPGA), or any other combination of hardware and software.

[0069] One having ordinary skill in the art will readily understand that the invention as discussed above may be practiced with steps in a different order, and/or with hardware elements in configurations which are different than those which are disclosed. Therefore, although the invention has been described based upon these preferred embodiments, it would be apparent to those of skill in the art that certain modifications, variations, and alternative constructions would be apparent, while remaining within the spirit and scope of the invention. In order to determine the metes and bounds of the invention, therefore, reference should be made to the appended claims.

1. A method, comprising:

transmitting, by an access point in a millimeter wave (mm-Wave) system, a first multi-beam sequence comprising a first burst type repeated on different antenna beams with a defined pattern of antenna beams;

transmitting a second multi-beam sequence comprising a second burst type repeated on the different antenna beams with said defined pattern of antenna beams after an automatic frequency correction (AFC) interval, wherein the first multi-beam sequence and the second multi-beam sequence are different.

2. The method according to claim **1**, wherein the first multi-beam sequence comprises a multi-beam acquisition sequence, and the first burst type comprises an acquisition burst.

3. The method according to claim **1**, wherein the second multi-beam sequence comprises a multi-beam AFC sequence, and the second burst type comprises an AFC burst.

4. The method according to claim **1**, wherein the AFC interval comprises a fixed number of symbol numbers between a last symbol transmitted in the first multi-beam sequence and a first symbol of the second multi-beam sequence.

5. The method according to claim **1**, wherein the AFC interval is a predetermined time interval between a last symbol transmitted in the first multi-beam sequence and a first symbol of the second multi-beam sequence.

6. The method according to claim **1**, wherein the first burst type and second burst type are identical.

7. The method according to claim **1**, further comprising waiting to transmit the second multi-beam sequence until one AFC interval after the multi-beam acquisition sequence had initiated.

8. The method according to claim **1**, wherein the first multi-beam sequence duration is one AFC interval long.

9. The method according to claim **1**, wherein the AFC interval is chosen to permit an estimation of a frequency offset up to a predetermined maximum value.

10. The method according to claim **1**, further comprising communicating the multi-beam pattern when it is not known by the access point and user device a priori.

11. The method according to claim **1**, further comprising repeating the multi-beam acquisition sequence to allow automatic gain control (AGC) adjustment.

12. The method according to claim **1**, further comprising repeating the multi-beam automatic frequency correction (AFC) sequence to allow automatic gain control (AGC) adjustment.

13. An apparatus, comprising:

at least one processor; and

at least one memory comprising computer program code,

wherein the at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least to

transmit a first multi-beam sequence comprising a first burst type repeated on different antenna beams with a defined pattern of antenna beams;

transmit a second multi-beam sequence comprising a second burst type repeated on the different antenna beams with said defined pattern of antenna beams after an auto-